

metallurgical processes by diagrammatic schemes such as the author has adopted; see p. 198, for instance. The one given for the blast furnace (p. 110) is certainly instructive.

The illustrations, of which there are nearly one hundred, are clear, but some of them are very old friends, while others are perspective drawings; and for a book like this, the reviewer would have preferred to see suggestive outlines and sketches, which the student could have transferred to his note-book with a few strokes of the pencil.

W. R.-A.

OUR BOOK SHELF.

Milk, its Nature and Composition; a Handbook on the Chemistry and Bacteriology of Milk, Butter, and Cheese. By C. M. Aikman, M.A., D.Sc. Crown 8vo. Pp. 173. (London: Adam and Charles Black, 1895.)

THE design of this little work is to give a short, popular statement of the more important facts concerning the chemistry and bacteriology of milk; and Dr. Aikman has succeeded admirably. A great deal of most valuable information is conveyed in a simple and eminently readable form, and it is a volume which is not only suitable for students in our recently started dairy-schools, but might well find a place in the library of any country-house. The general public is only very slowly awakening to the dangers which surround the consumption of dairy produce, and it requires the pressure of enlightened public opinion to produce the requisite reforms in the hygienic management of dairies. Dr. Aikman's volume, together with Dr. Freudenreich's "Bacteria in their relation to the Dairy," recently reviewed in these columns, should help a great deal in bringing about such reforms, which are not only of hygienic but of commercial importance to this country. In the section on the pasteurisation of milk, Dr. Aikman has overlooked an important fact, upon which the subsequent keeping power of such milk so largely depends, *i.e.* the immediate chilling of the milk after pasteurisation to a temperature below the point most favourable for germination. We think, in view of the recent valuable experiments, made in America and elsewhere, on the production of pasteurised milk on a commercial scale, and the importance of our adoption of a practice which has already gained considerable ground on the continent, Dr. Aikman might with advantage have entered more fully into this branch of the subject. Doubtless in a second edition Dr. Aikman will also expand somewhat the part devoted to cheese, and include some of the important and interesting results obtained by Bondzynski on the chemical composition of some varieties of cheese, published in the *Landw. Jahrbuch der Schweiz* last year. The illustrations accompanying the text are carefully chosen and well executed.

Elementary Physics. By John Henderson, B.Sc. (Edin.). Pp. 128. (London: Longmans, Green, and Co., 1895.)

IT may be well to remark at once that this is not a text-book of physics, but the first volume of a series of manuals designed solely for use in physical and electrical engineering laboratories. The present book is a general introduction to practical work in physics, and future volumes will be devoted to more advanced experiments. Altogether, eighty experiments are described, and are arranged in sections having the following succession: general physics, magnetism, electricity, heat, light, and sound. No serious attempt seems to have been made to connect the experiments in any particular order, so that, with few exceptions, they are independent of one another. A slight knowledge of physics is necessary before the student can understand and carry out the course of work described. This information may, however, be obtained

from lectures given concurrently with the laboratory work, though the order of the practical course is not what most teachers follow in their lectures.

The experiments can be performed without any very elaborate apparatus, and we have no hesitation in saying that the student who works through them will by so doing obtain a sound knowledge of many important physical laws. The knowledge thus gained by direct observation is far and away better and deeper than that obtained by reading text-books.

Practical Trigonometry. By H. Adams, M.I.M.E. (London: Whittaker and Co., 1896.)

THE author of this small book is careful to point out that it is not a text-book; but it will be found useful to practical men, in enabling them to undertake the perusal of other than elementary works where a knowledge of trigonometry is essential.

The book is so arranged as to gradually disperse the difficulties to beginners in trigonometry, and it cannot but prove an incentive to further study. As an *aide-mémoire*, however, the absence of proofs, to secure brevity, will diminish its value for examinations where trigonometry is a special subject.

W. S.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Remarkable Sounds.

WITH reference to Mr. McKenny Hughes' letter on this subject, which appears in your issue of the 14th ult., and to his suggestion that it "would be of great help if we would get some exact data as to the distance at which the sounds of great guns, of blasting, or of waves, can be proved to have been heard," I would ask permission to be allowed to cite my experience on the north coast of Spain at the fishing village of Comillas, about twenty-four miles west of Santander. The bay which gives rise to the port is relatively small, and of inconsiderable depth inland; the south-east part of it is limited shorewards by cliffs of limestone, which rise to a height of about 120 feet, and somewhat overhanging the base or water-line. When the groundswell—so characteristic of the Bay of Biscay—comes in to this bay, the breakers are very remarkable, and dangerous for small fishing-boats, being relatively high, and succeeding one another with great regularity. They break against the cliff mentioned with a thundering noise, and such that I have frequently heard them at eight miles' distance inland, although high and uneven ground lay between me and the coast, and the weather was relatively calm, so that the sound could hardly be favoured in its transmission by the wind. In stormy weather, and when the weather has been bad seaward, then the waves are even more terrible, and the sound heard still farther away.

Dublin, November 27.

J. P. O'REILLY.

IT is a pleasure to me to see Prof. Darwin's note on curious sounds, in NATURE for October 31, since I have often been puzzled by what is obviously precisely the same phenomenon along the Bay of Fundy coast of New Brunswick, particularly about Passamaquoddy Bay, where I have been a great deal in the summer. Locally it is explained as the reports of the guns of Indians shooting porpoises off the islands of Campobello and Grand Manan; but, for several reasons, I never believed this: in fact, I have always been sure it must be due to some other cause, though I could think of no explanation. It is heard most often in summer, in rather still and warm weather, on those days when the heat-haze hovers upon the ocean, and appears to come from seaward.

W. F. GANONG.

Smith College, Northampton, Mass., U.S.A.

THE "humming in the air," to which Mr. Tomlinson calls attention in your last number, is noticed in White's "Selborne."

"There is a natural occurrence to be met with upon the

highest part of our downs in hot summer days, which always amuses me much, without giving me any satisfaction with respect to the cause of it; and that is a loud audible humming as of bees in the air, though not one insect is to be seen. This sound is to be heard distinctly the whole common through, from the Moneydells to my avenue gate." (Vol. ii. p. 94, Macmillan's edition.)

W. TUCKNELL.

November 30.

Fireball of November 22.

ON November 22, at about 6h. 51m. I observed, in a sky quite overcast, a brilliant prolonged flash quite different to lightning. The whole firmament was illuminated for more than a second with an intensity greater than that which the full moon could have occasioned, and the glow seemed strongest in the south-east. Not a star was visible, but though the origin of the outburst could not be observed, no doubt existed that a fireball of the most brilliant type had fallen.

Mr. R. Sheward's letter from Eastbourne (NATURE, November 28, p. 78) affirms this conclusion, and it would be well if he or others who witnessed this striking object would give particulars as to the path it traversed. Appearing, as it did, at a convenient time in the evening, it must have had many observers, though unfortunately in the west of England the sky was veiled in cloud. For purposes of calculation it is not sufficient to have descriptions which merely indicate the general direction of the meteor's flight, as, for example, from east-north-east to west-south-west. We require to know the altitudes as well as the azimuths of the initial and terminal points, or the co-ordinates read from a celestial globe or star chart. A particular account of the path relatively to the stars near would be equally useful.

It is to be hoped that such information will be forthcoming in regard to this splendid meteor, which, from the manner in which it illuminated the clouded sky, must have been a very exceptional object of its class.

At this period in November many large fireballs are directed from the region of Taurus; but it is impossible to say, in the absence of necessary details, whether or not the fine meteor of November 22 last belonged to the Taurid stream.

Bristol, November 29.

W. F. DENNING.

IN reference to the letter of Mr. Sheward in last week's NATURE, it may be of interest to mention that whilst talking to a friend in a dark road in this locality on the evening of November 22 the sky at the time being entirely overcast, we were startled by the sudden illumination of the clouds as if by the outburst of a bright light above them. The effect was similar to that which might have been produced by the explosion of a large magnesium shell sufficiently brilliant to illuminate the entire sky. The light appeared suddenly, but faded out gradually, its estimated duration being three seconds. It appeared to me to emanate from a point in the north-east, at an altitude of about 60'. My friend, whose face was turned in the opposite direction, could not localise the outburst, though he remarked that the light suffused the clouds almost equally in the west and south-west. I noted the time as 6.48 p.m., which so nearly coincides with that mentioned by Mr. Sheward, that although so far apart it seems probable that we were witnesses of the same phenomenon.

R. T. LEWIS.

Ealing, W., December 2.

A Joint Meeting of Associations for the Advancement of Science.

MY suggestion for a joint meeting of the British, Australasian, and American Associations for the Advancement of Science at San Francisco in 1897, at some time conveniently near to that of the Toronto meeting of the British Association, published in your issue of October 24, meets favourable reception in the United States and Canada. I have recently received a letter from Sir Wm. C. Van Horne, President of the Canadian Pacific Railroad, and a member of the British Association, in which he says that he will instruct his superintendent to reopen negotiations with other transcontinental roads to secure favourable rates of transportation. Prof. Joseph Le Conte, who has for years given earnest effort to secure a meeting of the Association on the Pacific coast, writes from Berkeley, California: "I will certainly interest myself in your scheme . . . I am glad you are moving the affair so early, and thank you for drawing my attention to it."

NO. 1362, VOL. 53]

The following is a copy of a letter just received from the Mayor of San Francisco:—

MY DEAR SIR,—

Your communication of October 9, 1895, was received and thereafter forwarded to the Board of Supervisors.

That body, on October 28, 1895, passed a resolution, and it is herein inserted in print.

"Resolution No. 13, 120 (Third Series)."

"Resolved—That his Honour the Mayor be, and is hereby empowered and requested to invite the American and Australian Associations for the Advancement of Science to meet in this city in 1897; also, to invite the British Association of the same character to meet said Associations in this city as invited guests, and to that end to take such action as may be proper to arrange for their comfort and accommodation on that occasion.

"And the clerk is hereby directed to advertise this resolution as required by law.

"Board of Supervisors, San Francisco, October 28, 1895."

Pursuant thereto, an invitation is thereby sent to your Society—the American Association for the Advancement of Science.

It is my sincere hope that San Francisco may have the good and rare fortune to receive the visit of all three of these distinguished bodies.

The gathering of the world's chosen scientists is at once recognised as of high importance to our Municipality.

Its citizens will feel honoured in extending a generous welcome to men eminent in the cause of truth, and representing the three great branches of the Anglo-Saxon races.

Should this invitation be accepted, an early notification thereof is requested.

Invitations have been sent to the British and Australian Associations. (L. S.)

ADOLPH SUTRO.

Application will be made to Congress at its session, which begins on the first week of December, for an appropriation to assist the American Association for the Advancement of Science towards defraying the necessary expenses of holding a meeting so distant from the homes of most of our members. It is, of course, impossible to foretell what Congress may be willing to do in the matter; but as it has never before been asked to subsidise the Association, we may hope that some appropriation may be secured.

WM. H. HALE.

Brooklyn, November 18.

The Metric System of Weights and Measures.

THE adoption of the metric system in this country can be best effected by first familiarising the people with it for some years. I would suggest that the following would form a good beginning:—

(1) Its adoption by the Post Office. At present the weight of a foreign letter that will go at the minimum rate, must not exceed $\frac{1}{2}$ oz. if posted in England, while 15 grammes are allowed on the continent, which is rather more. The 15 grammes limit should be adopted in England for foreign postage, and 30 grammes for inland postage. Parcels and newspapers should also be charged according to the metric system.

(2) The metric system should be employed by the Meteorological Society and Meteorological Office. At present our weather statistics cannot be compared directly with those published on the continent. The same course should be also followed by other sciences (e.g. geology, astronomy, &c.) that still use miles, yards, feet, &c.

(3) Government topographical and geological maps should all bear a scale of metres and kilometres.

There are, of course, many other ways in which the metric system could be brought before the public.

December 2.

JOHN W. EVANS.

"Dendrexetastes capitoides."

DR. FORBES has been kind enough to send me for examination the typical specimen of *Dendrexetastes capitoides* of Eyton, now in the Derby Museum, Liverpool, to which he has called attention in a letter in NATURE of October 24 last (NATURE, vol. lii. p. 619). I have compared it with specimen *a* of *Dendrexetastes temminckii* in the British Museum, and do not hesitate for a moment to say that they are referable to the same species. Both are from Cayenne, and of the ordinary unmistakable "Cayenne make." But it is quite true that, as pointed out by Dr. Forbes, the cross-bands on the belly, which